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ABSTRACT

Information is provided regarding instructional teaching strategies and cognitive/learning strategies as well as other information important for successful learning. This module will aid vocational agriculture teachers and special needs students in confronting new situations with a strategic plan. Four definitions, 11 frequently asked questions, and 16 references are included. The following questions are answered: What is a strategy? What types of strategies might be used? What is a learning style? How will learning styles affect instructional strategies? Who needs to be taught strategies? Why should I teach strategies? How often should I use strategies? What are some examples? How do I include strategies in my daily life? How can I teach effective strategies to students with or without special needs? and How can I use strategies for vocational agriculture? (NLA)

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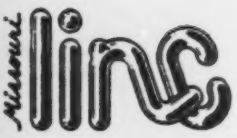
Strategies for Learners With Special Needs in Vocational Agriculture



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Abstract:
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CE 058 623

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Overview

Vocational agricultural students may become involved in a variety of areas within the field of Agriculture. This module will give three examples of instructional strategies and three examples of cognitive strategies for three Vocational Instructional Management competencies in the area of Agriculture. When an instructor uses a variety of instructional and cognitive strategies in the classroom or shop, this allows students to become more actively involved in the learning process.

Definitions/Terminology

Cognitive/ Learning Strategy	These strategies are techniques the student uses to acquire knowledge for learning.
Instructional/ Teaching Strategy	These strategies are techniques utilized by the teacher to enable students to learn more effectively.
Learning Style	The actual manner in which a student learns information and forms a series of conditions in which the person can concentrate, absorb and retrieve information or skills that may be new or difficult.
Strategy	A planned deliberate activity used to acquire knowledge.

Frequently asked questions

Q. What is a Strategy?

A. A strategy is a planned deliberate activity used to acquire knowledge (Reid, 1988). According to Alley and Deshler (1978), strategies are: techniques, principles or rules which enable a student to learn, solve problems and complete tasks independently. Strategies specifically focus on teaching students how to learn and demonstrate a command of knowledge when performing in vocational or academic areas.

Q. What Types of Strategies Might be Used?

A. There are many types of strategies utilized in classrooms today. In this module we will examine two major types of strategies. Those two types of strategies include instructional/teaching and cognitive/learning strategies.

Instructional/Teaching strategies are techniques utilized by the teacher to enable students to learn. Instructional strategies include those activities the teacher plans in order to help students of all learning abilities to acquire the information being presented.

Cognitive/Learning strategies are those techniques the student uses to acquire knowledge. The way a person goes about perceiving, remembering, thinking and problem solving are cognitive strategies. Students must be taught **how** to effectively acquire techniques for learning. Cognitive strategies enable students to confront new information and/or situations with a strategic plan which allows for successful learning.

Q. What is a Learning Style?

A. Learning styles are the innate sensory and interpersonal methods a student prefers to acquire specific skills. It is the actual way in which a student learns information and forms a series of conditions in which the person can concentrate, absorb and retrieve information or skills that may be new or difficult.

Q. How Will Learning Styles Affect Instructional Strategies?

A. As strategies are not the same as learning styles, both teachers and students need to consider the student's style of learning when attempting to teach strategies. These styles may vary for a student both between and within content areas. For example, if a student is an auditory, visual or kinesthetic learner who learns best in a group situation, the strategies used by the teacher will need to consider all of these learning styles for the student. By recognizing the learning styles of the individual student, the instructor can plan strategies that will best suit each student.

Dunn and Dunn (1978) have identified four types of learning styles. They are:

Visual Learners learn from looking. They learn best from visual modes of instruction.

Auditory Learners learn from listening. They learn best from modes of communication that utilize sound.

Tactile & Kinesthetic Learners learn through hands-on experience. They need to touch and manipulate concrete materials.

Multisensory Learners learn best by combining two or more of the above types of learning.

An instructor will want to become proficient in a variety of instructional/ teaching strategies in order to meet the individual cognitive needs of the students. (For further information see Missouri LINC's *Learning Styles* Hotline Module).

Q. Who Needs to be Taught Strategies?

A. All students need to be taught a variety of strategies which will help them learn more effectively. The challenge to teachers is to transform passive learners into learners who are more actively involved by teaching/ showing them effective strategies for gaining and responding to information (Deshler & Schumaker, 1986). By using various instructional/teaching strategies, teachers may enable students to acquire a variety of cognitive/learning strategies to assist in their own learning.

Q. Why Should I Teach Strategies?

A. A teacher lectures, "successful" students listen, take notes, ask questions, answer questions and may contribute to the discussion. When an assignment is given, successful students will make efficient use of class time, consult textbooks or other resources to answer questions and complete the assignment within the specified time. These students are called active learners. In contrast, less successful students attend class only part of the time, write a word or two and will very rarely contribute. When the assignments are given, they lack direction, have little idea of where to begin, what strategies to use to find information, how to interpret maps, how to look up words in the glossary or ask the teacher for help. By the end of class time, they don't have the work finished or the skills necessary to complete the work even after having the same amount of class time as the successful learners. Gleason (1988) describes these students as passive learners. Will (1986) says that currently there are over a million students receiving remedial services in classrooms for students with mild handicaps because of academic deficiencies. All teachers should be concerned about the effectiveness of their teaching. With Missouri's dropout at approximately 24% (J. Heskett, personal communication, June 13, 1990) there is a definite need for concern. Using strategies during the teaching process, may enhance teaching style and student learning.

Q. How Often do I Need to use Instructional Strategies?

A. Instructional/teaching strategies should be used in all courses on a daily basis. Determining which strategy to use depends upon its appropriateness for the material that is being taught as well as student needs and previous experiences. There are a variety of instructional strategies, and it is important to utilize a number of methods so students may acquire alternatives if one doesn't work for them. Also keep in mind the learning styles of each individual student.

Q. What are Some Examples of Cognitive/Learning Strategies?

A. Many instructional/teaching strategies are also considered to be cognitive/learning strategies. The goal of a cognitive strategy is to increase the student's control over, and use of strategies which increase their capacity for learning (Collier & Hoover, 1987). Thus teaching the student "how to learn." Some examples are: Reciprocal Teaching, Study Guides, Mnemonics, Rapping, Mapping, RAPS, SCORER, Self-talk and Self-questioning. Whatever strategies a student uses to aid in self-learning, may be the proper strategies.

Q. How do I Include Strategies in my Daily Lessons?

A. When planning a lesson, decide how you wish to teach. Since many instructional strategies can be adapted to different objectives or competencies being taught, it is just a matter of picking one which suits your teaching style and your students' needs. You also need to check that your plans include a variety of cognitive strategies, motivating factors and learning styles information. If any aspect is missing, you may not be teaching the students in a manner which will truly benefit them. Utilizing cognitive and instructional strategies with students with special needs can make a difference. It could make **the** difference (Kearns, 1989).

Q. How can I Teach Effective Cognitive Strategies to Students With or Without Special Needs?

A. The University of Kansas Institute for Research in Learning Disabilities has done extensive work in developing cognitive/learning strategies. According to them, there are eight steps which should be helpful in teaching **all** learning strategies:

Pretest and obtain commitment to learn: During this step, determine which strategies each student does not know, and from this point you will be able to show the students the progress they have made while learning this strategy.

Describe the new strategy: An important step in the process is to describe to the students what you are teaching them and why it is important to learn. Discuss how the new strategy will contribute to future success and particularly how it can be used for more active participation in class.

Model the new strategy: In this particular step of the process, the activity is teacher driven, but involves both the student and the teacher. You will need to show implementation of the strategy step-by-step with explicit instructions.

Verbal rehearsal of the steps of the new strategy: Once again this step involves the student and the teacher, but this time the student is in control. This is the students chance to verbally demonstrate to the teacher that the steps of the strategy in the appropriate sequence are known.

Controlled practice and feedback: The student is now given the chance to perform the new strategy within the controlled setting. The teacher, observing the student's performance, should give both positive reinforcement as well as constructive criticism.

Grade-appropriate practice and feedback: The student now performs the strategy on grade-appropriate information that is given, and once again the above-mentioned feedback is given.

Posttest and obtain commitment to generalize: This step refers back to the initial step in which the students were introduced to the strategy. First, state the purpose for using the learned strategy and possibly present ways in which it may be used for all information received. The posttest results should be used to provide students with their rate of success.

Generalization: The most important step in teaching students cognitive/learning strategies is the ability of the students to generalize the strategy for outside classroom situations. This step reinforces the main reason for presenting students with cognitive/learning strategies: To teach students "how" to learn information independently (Deshler & Schumaker, in press).

Remember, it is important to provide multiple opportunities for practice, each time presenting a novel situation or a new set of materials, in order to show students that the steps in a strategy remain the same even when the task or materials differ.

Q. How can I use Strategies for Vocational Agriculture?

A. The following are some specific examples of ways to use strategies in vocational agricultural classes. Included will be the instructional strategies of: Mapping, Words on the Wall and Modeling. The cognitive strategies included are: Paraphrasing, Rapping and Self-Questioning.

Mapping

Mapping is a technique used to outline information. It allows the student to see the relationship between the parts and the whole and vice versa. It can be used to introduce a unit, explain a concept, prepare for a test and/or organize notes.

Unit:	Arc Welding
Lesson:	#1
Competency:	List the safety procedures required when arc welding Agricultural Science 1 (AG-115C), Arc Welding, Task 1
Instructional/ Teaching Strategy:	Mapping

The following page is an example of mapping.

Paraphrasing

A student may use paraphrasing as a cognitive strategy when studying Arc Welding. Paraphrasing is retelling information just taught or read by putting it in the learners own words. This helps facilitate storage and recall of information. The instructor asks the student to paraphrase the steps to be used to protect themselves during welding.

Unit:	Arc Welding
Lesson:	#1
Competency:	List the safety procedures required when arc welding Agricultural Science 1 (AG-115C), Arc Welding, Task 1
Cognitive Strategy:	Paraphrasing

Instructor: When you are welding, what are the specific safety procedures that you should follow?

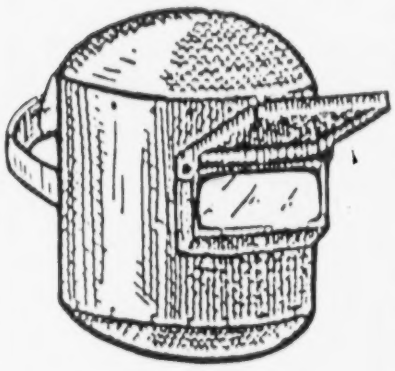
Student: Since we learned that there is radiation being given off when I weld, I need to do the following things:

Removing Slag

- Cool the weld
- Chip slag, don't hammer
- Strike bead near point where slag meets metal with the swing of arc away from eyes

Protective Clothing

- Long sleeved shirt with collar and sleeves buttoned
- Dark clothing better than light
- High top shoes-protect from hot metal
- Pants cuffless or cuffs rolled down
- Leather gloves in gauntlet type



Eye Protection

- Chipping slag
- Grinding

Fumes

- Weld in well ventilated area
- Close quarters, use fan for forced ventilation
- Welding galvanized/zinc-coated parts with **extreme** care

Arc Welding Safety

Protect Against Radiation

- Use face and head shield in good condition
- **Never** look at arc with naked eye
- **Never** strike arc when there are bystanders that are not covered
- Wear clothing that covers all skin

Preventing Fire

- Don't weld around shavings, oil, hay or feed
- Keep welding booth clean and free of scraps and rubbish
- **Never** weld or heat drums used for gas, oil or similar matter

- Make sure that I don't look at the arc without wearing my shield
- I need to use a shield that is in good condition for my face and head
- When people are around me without any kind of protection--I should never strike an arc and
- I need to make sure that I cover my skin with clothing

Student: As far as the clothes I need to wear to protect me from the splatter of molten metal

- I should wear long sleeved shirts and button all my buttons
- Wear dark colored clothes instead of light ones
- Wear my high top shoes
- Wear pants that are don't have cuffs or roll the cuffs down
- Wear some leather gloves-the gauntlet type

Student: I need to make sure that I wear clear goggles in 2 of the welding operations including:

- When I am Chipping slag and
- When I am Grinding

Student: Then there are the precautions that I need to follow for proper ventilation for the area I will be working in:

- I need to weld in a well ventilated area
- Whenever I am in close quarters--I am supposed to use a fan to force the air, and finally
- I need to be extremely careful when welding on galvanized or zinc-coated parts

(Linhardt, Morton & Lamb, 1982)

Words on the Wall

Keeping records are an important part of the Supervised Agricultural Experience (SAE) program. To complete forms it is important to understand what is being asked. A complete set of records will assist in planning and analyzing the farm business and serve as a basis for decision-making. The instructional/teaching strategy of Words on the Wall is used to help students learn new vocabulary words or remember important factors. The strategy increases word recognition and provides a quick reference when students forget meanings. During this strategy, butcher paper (or other, large paper) is hung on the wall. Throughout the unit of study, vocabulary, other important words and their definitions may be written on the wall by the students or teacher. For example, we might see the following information on the "Wall" for this lesson.

Unit:	Opening the *Missouri Agricultural Record Book for Secondary Students*
Lesson:	#1
Competency:	Complete forms needed to open the *Missouri Agricultural Record Book for Secondary Students* Agricultural Science 1 (AG-115C), Developing Programs of Supervised Agricultural Experience, Task 1
Instructional/ Teaching Strategy:	Words on the Wall

Cash Flow Summary - totals from receipts and expenses for each month

Cash Flow Plan - expected receipts for the year

Depreciation - reduction in value due to wear, tear, exhaustion and obsolescence

Ending Inventory - livestock, machinery, supplies, etc. on hand at the end of the year

Landlord-Tenant Relations - Many farm business operators rent land and facilities

Liabilities - financial obligations or debts against the SAE program, divided into non-business and business liabilities

Net Worth - the student's equity in the SAE program, calculated by subtracting total liabilities from total assets

Assets - items of value owned by the student

(Admire, 1989)

As you progress with the unit, you will also be increasing the student's vocabulary. This can be quite helpful for students while they are developing and keeping their own records.

Elaboration

Elaboration occurs when students think about new ideas in connection with prior knowledge (Derry, 1990). Elaboration is often spontaneously developed by the student and does not necessarily need to be prompted by instructional material. Elaboration is logical inferences, images, continuations, examples, details or anything else that serves to connect the information for the individual (Gagne', 1985). An example of elaboration can be described by looking at the difference between a cash flow summary and a cash flow plan in a SAE project (Admire, 1989). When students think about these differences, they ought to be able to distinguish between them. One method of helping students to anchor these differences in their mind is elaboration.

Unit:	Using the *Missouri Agricultural Record Book for Secondary Students*
Lesson:	Opening the *Missouri Agricultural Record Book for Secondary Students*
Competency:	Complete forms needed to open the *Missouri Agricultural Record Book for Secondary Students* Agricultural Science 1 (AG-115C), Developing Programs of Supervised Agricultural Experience, Task 1
Cognitive Strategy:	Elaboration

Elaboration could assist a student who was opening a record book for a SAE and needed to distinguish clearly the differences between a cash flow plan and a cash flow summary. For Example:

Teacher: Let's discuss a cash flow plan. First, what do you think about when you think of a plan, any plan?

Student: When I plan something it is something that I want, anticipate, or expect to happen. I think of a blueprint to me, is a type of plan that has been laid out to demonstrate what you expect to accomplish or build. However, a blueprint, as well as something I would plan can be altered.

Teacher: That's right, a cash flow plan is used when projecting the **expected** expenditures for the year. Now, let's discuss the cash flow summary. What do you think of when you think of a summary?

Student: I think of a summary at the end of a chapter in a book. It will give the actual facts and numbers that are important to remember from the entire chapter.

Teacher: That's true and a cash flow summary is used when discussing the years **actual** receipts and expenses for that years' SAE project. Let's recap. A cash flow plan, like a blueprint, can be altered because you use expected receipts. Whereas, a cash flow summary, as a summary at the end of a book, uses the years actual numbers.

As you can see, the cognitive strategy of elaboration can help the student "construct" whatever appropriate responses are needed. Elaboration may help in taking a test, needing to recall the information, or in a discussion.

Modeling

Modeling is a method in which a desired behavior is presented as it is being described. In other words, modeling requires doing and saying. For example, modeling can help students understand where they are to administer certain drug type injections to cattle to fulfill a portion of the competency.

Unit:	Beef Production
Lesson:	Cow-calf management
Competency:	Plan a program for managing a herd from calving through weaning Agricultural Science 1 (AG-115C), Beef Production, Task 3
Instructional/ Teaching Strategy:	Modeling

- Visit a veterinarian on a day he is working with cattle. The instructor could discuss with the veterinarian ahead of time what the students would learn from the observation. The veterinarian could demonstrate (model) for the students various injections in a variety of administration sites.

For example:

Intraperitoneal Injection
(Right side **only**)
Intramuscular injection
(deep into muscle)
Intravenous injection
(into the jugular vein)
Intrarumen injection
(Left side **only**)
Subcutaneous injection
(under the skin)
Oral injection (by mouth)
Intranasal (into the nostril)

Since injecting drugs in the wrong area or in the wrong manner can reduce the effectiveness of the drug, cause an adverse reaction or cause illegal drug residuals or even death, it is imperative that agricultural students understand and be able to retrieve this information (Stewart, Hunter & Sparks, 1987) in a step by step procedure that has been taught by modeling.

- Show a video or slide presentation on the various sites for injections.

- Bring the different vials of medications and the appropriate shot cylinders (no needles) in for the students to see hands on. Demonstrate the different types of vials and shots. Then let the students demonstrate their knowledge of injection sites--talking through the steps as they perform.

Modeling should be paired with verbalizing in each step of instruction. This will reinforce the information that has been taught.

Self-Questioning

A self-questioning strategy allows the student to turn a main idea/topic into questions, and provides situations for practice and feedback (Billingsley & Wildman, 1990). Miller (1985) showed that students enhanced their ability to be successful at a task if the students talked out loud to themselves. To do this effectively, students need to begin by asking the what, where and when questions. Once these questions have been asked, conclusions can begin to form. This strategy needs to be introduced to students early and then demonstrate how to utilize the strategy in all learning. To aid in fulfilling the competency of planning a program for managing a herd from calving to weaning, students need to know about drug administration and basic health care programs. A technique which can aid the student in learning this is self-questioning. By asking questions, the instructor helps the student become familiar with the information and understand how the technique of self-questioning is used.

Unit:	Beef Production
Lesson:	Cow-Calf Management
Competency:	Plan a program for managing a herd from calving to weaning Agricultural Science 1 (AG-115C), Beef Production, Task 3
Cognitive Strategy:	Self-Questioning

Using "drug administration sites on a beef herd" as the topic, one could begin forming questions such as:

- With my herd, what health program should I be following?
- What type of injection goes into the right side **only**?
- What type of injection goes deep into the muscle?
- What type of injection goes into the jugular vein?
- What type of injection goes under the skin?
- What could happen if I inject the wrong drug in the wrong place?
- From what I have learned, what are the appropriate ages for the recommended procedures?

As learners ask these questions, they can begin mauling over information that has been previously modeled by the teacher, read or gathered from lectures. Learners can use this information to reach final conclusions. These conclusions can be checked by another student or by the instructor to give immediate feedback.

It is important for students to recognize that there are several ways to learn the information that has been set before them. The hands-on education that vocational schools offer is invaluable to many learners. As educators, pick up the challenge of transforming all students who are currently passive learners into students who are active learners. This can be accomplished if we identify the learning styles of students **and** use the most effective strategies to teach them. Teaching strategies may mean going the extra mile. Many of us had teachers who went the extra mile for us when we were students, and we may desire to emulate them. One saying written by an anonymous author is, "There are no traffic jams on the extra mile." Using a variety of teaching strategies to help students learn more effectively, puts you on that stretch of road.

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